

Exam.Code:1031
Sub. Code: 7862

1129
M. Tech. (Material Science)
Third dSemester
MST-302: Nano-Materials

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- i. Answer the following:-
 - a) Explain properly the principle of thermal evaporation technique.
 - b) What are self assembled surface films?
 - c) Explain the terms nano-mechanics and nano-electronics
 - d) Justify by giving examples that the core shell nano-materials are useful in the biomedical field.

UNIT – I

- ii. How will you synthesize the nanoparticles using cluster beam evaporation technique? Describe the working principle and instrumentation of this technique. Write the silent features of this technique? (10)
- iii. a) Discuss about the steric stabilization in nanostructured materials. Write some of its applications.
b) Chemical vapor deposition is one of the best techniques for the deposition of uniform film. Justify this statement by taking a suitable example. Also, discuss this technique in detail. (5,5)
- iv. Write briefly about the following:
 - a) Ball milling technique
 - b) Electrostatic stabilization (5,5)

UNIT – II

- v. How will you do the nanostructured carbon coating? Describe this nanostructuring by taking a suitable example. Also write some applications of this type of carbon coating. (10)
- vi. Write short notes on the following:-
 - a) Nanobots
 - b) Vapor sensors (5,5)

P.T.O.

(2)

- VII. a) What are photonic crystals? Explain applications of such type of crystals by taking proper examples.
- b) What are potential adverse effects of Nanomaterials on environment? By taking suitable examples discuss these effects in brief.

(5.5)

x-x-x